MICRO-80

P.O. BOX 213, GOODWOOD, S.A. 5034 AUSTRALIA
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** ABOUT MICRO-80 **

EDITOR: Ian Vagg
ASSOCIATE EDITORS: Peter Hartley, Eddy Paay.

MICRO-80 is the only Australian monthly magazine devoted entirely to the Tandy TRS-80 microcomputer and the Dick Smith System 80. It is available by subscription, $24.00 for 12 months or by mail order at $2.50 per copy. A cassette containing all the programs in each month's issue is available for an additional $3.50 or a combined annual subscription to both magazine and cassette, is available for $60.00. Special bulk purchase rates are also available to computer shops etc. Please use the form in this issue to order your copy or subscription.

The purpose of MICRO-80 is to publish software and other information to help you get the most from your TRS-80 or System 80 and their peripherals. MICRO-80 is in no way connected with either the Tandy or Dick Smith organisations.

** WE WILL BUY YOUR PROGRAM **

Most of the information we publish is provided by our readers, to whom we pay royalties. An application form containing full details of how you can use your TRS-80 or System 80 to earn some extra income is included in every issue.

** CONTENT **

Each month we publish at least one applications program in Level 1 BASIC, one in Level 2 BASIC and one in DISK BASIC (or disk compatible Level 2). We also publish Utility programs in Level 2 BASIC and Machine Language. At least every second issue has an article on hardware modifications or a constructional article for a useful peripheral. In addition, we run articles on programming techniques both in Assembly Language and BASIC and we print letters to the Editor and new product reviews.

** ADVERTISING **

We accept camera ready copy for display advertising at the following rates:

- FULL PAGE (19cm. wide x 24cm. high) $50.00
- 1/2 PAGE (19cm. wide x 12cm. high) $30.00

Classified advertisements are $5.00 for up to 50 words. Advertisements must be submitted by the 23rd of each month in order to appear in the following month's issue. A Company Order or payment must be included with the advertisement.

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** LIABILITY **

The programs and other articles in MICRO-80 are published in good faith and we do our utmost to ensure that they function as described. However, no liability can be accepted for the failure of any program or other article to function satisfactorily or for any consequential damages arising from their use for any purpose whatsoever.

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***** EDITORIAL *****

We successfully completed our move to new premises during the month. This has caused some slight delays in filling some of your orders, but everything is on an even keel now. Our aim is to fill all orders for new subscriptions and software within 48 hours of receipt. We are just about there now, and should certainly achieve this target within the next month.

Last month we told you that we expected to become an authorised BANKCARD merchant and would then be able to offer a 24 hour telephone order service for subscriptions and products. Well, we are now a BANKCARD merchant and you will find instructions, on the order form in each issue, telling you how you can use your BANKCARD to pay for a subscription or software. Unfortunately, BANKCARD does not yet offer a telephone order service, so you will still need to write in. There is a chance that this will change in the not too distant future, so we will keep you informed.

** ABOUT OUR CASSETTES **
Over the past few months we have had a few complaints from readers that their cassetes would not load satisfactorily. We have immediately replaced these cassettes and have attempted to improve the quality by purchasing progressively more expensive cassettes. We are indebted to one of our Melbourne readers, Bob Callender, for carrying out some fine investigative work on the cassettes. Using his oscilloscope, Bob discovered that the data pulses on Level 1 programs were different from those made directly from the CPU, the effect being to make our cassettes difficult to load except at very high volume settings. Bob's findings arrived just a few days after we had made some significant changes to the manner in which we reproduce the cassettes so we immediately sent off a new style cassette for Bob to put through its paces. Bob has gven these new cassettes a completely clean bill of health. They load very easily and have data pulses indistinguishable from those you obtain when you make your own cassettes direct from the CPU.

If you have purchased cassettes from us and have had loading problems, please write in and we will replace them with the new, easy loading cassettes. There is no need to send the old ones back and we will pay the postage for the replacements. From now on, all cassettes supplied will be made by the new method. Personally, we know of no better value for '80 users anywhere in the world than a monthly copy of MICRO-80 and its cassette, at the annual subscription rate of just $5.00 per month!

So, how have we solved the problem? Firstly, our greater volume of cassette subscriptions, plus MICRO-80 PRODUCTS software orders, now enable us to buy high quality, professional audio cassettes at wholesale rates. The cassettes you receive from us are the same ones used by recording studios and radio stations. Next, they are now reproduced on the same high speed cassette duplicating equipment used by studios and large volume software manufacturers. This equipment is of very high quality (and very expensive!). So, you can rest assured that from now on, all cassette software supplied by MICRO-80 or MICRO-80 PRODUCTS, is of a quality at least equal to that made in the USA or anywhere.

** MORE ABOUT CASSETTES **
MICRO-80 PRODUCTS has been appointed a distributor for SCOTCH brand personal computing cassettes. SCOTCH is a division of the 3M's company and has been a leader in the magnetic media field for many years. The cassettes are of very high quality indeed and have been designed specifically for use on personal computers. They come in two sizes, C-10 and C-30.

You will see a MICRO-80 PRODUCTS advert. later in the magazine. We now use these tapes for our own masters and cannot recommend them highly enough.

** THE RUMOUR MILL **

Over the past few months, all sorts of rumours have been coming out of the USA about Tandy's future intentions towards the TRS-80. The magic date sems to be June 1, 1980 when it is expected that Tandy (Radio Shack over there) will release a new computer called the TRS-90. At the very least, this computer will interface with a colour TV set. Those responsible for spreading rumours, however, are not sure whether the TRS-90 will:

- have a keyboard initially, or not
- be a serious personal computer or just a super games machine
- be compatible with TRS-80 software
- be the replacement for the TRS-80

It is this last point which is causing some consternation.

Still another rumour says that the TRS-90 will replace the Level 1 4K TRS-80 only, so that the Level 2 machine will continue in production.

Whatever the truth of these rumours, 150,000 TRS-80's have been sold, about 6000 of them in Australia. You can be sure that there will be many organisations, including MICRO-80 which will continue to support the TRS-80 for a long time to come.

** THE SYDNEY HOME COMPUTER SHOW **

MICRO-80 will have a stand at the Sydney Home Computer Show to be held in the Westco Pavilion at the Sydney Showgrounds from Thursday May 22 to Sunday May 25. Peter Hartley will be there, and looks forward to meeting as many of our readers as possible. He will also have copies of all MICRO-80 PRODUCTS software for demonstration and sale. We hope to have the eagerly awaited book by Eddy Paay - Level II ROM MAP on sale too. Many of our readers have expressed interest in the memory expansion board we have been developing. This is a very major project but, with a little bit of luck, we will also have the prototype there, operating, for you to see. Why not come along to the Show and give us a chance to meet you.

** ASSEMBLY LANGUAGE PROGRAMMING - Part 4 **

Part 4 of our series on Assembly Language Programming has been held over until next month to enable Eddy to concentrate on the Level II ROM MAP Book.

- 00000 -

***** ATTENTION LEVEL I USERS ***** SPECIAL OFFER

MICRO-80 has, surplus to requirements, one only Level II upgrade kit, complete with all installation instructions.

We are prepared to sacrifice this kit for a mere $150.00.

If you've been thinking about upgrading, ring the Editor on 71 9683, and save a small bundle. - Remember, there's only one, so DO IT NOW!

***** NEXT MONTH'S ISSUE *****

The May issue of MICRO-80 will contain at least the following...

SPACE DRIVE (L1)	Several unusual twists to the traditional "you land it" space game. This massive program will make next month's edition an old fashioned bargain for all you Level I'ers.
SUB ATTACK (L1)	In which you command a shore battery and pound the enemy subs as they foolishly bob up in the harbour before your eyes - if you're quick enough! This one's good fun for game lovers of all ages.
TIC-TAC-TOE (L2)	An old favourite in a superior package that's a worthy addition to any software collection.
SUPER SIZZLER (L2)	According to the author - this real-time game is based on the experiences of life. We can only assume that the author makes his living from using a gun, and runs around in a panel-van, sticking-up motor wreckers!
TRIG/BAS (L2)	A powerful solver of trigonometry problems.
HOUSEHOLD BUDGET (L2)	An amazingly comprehensive household accounting system that will output to screen or line printer as required. Easily adapted to suit smaller business applications.
TWO LEVEL, ON BOARD CASSETTE MONITOR	Gives you on board capacity to monotor your cassette, during all record and play modes, with both the CTR 80, CTR 40, and CTR 41 decks. Gives not only on and off modes, but also special subdued level so that you will not disturb the family while they sleep and you are at your creative best. Costs about $6.50.
ASSEMBLY LANGUAGE	The next installment of Eddy Paay's brilliant series which, regrettably, was held over from this edition.

The April issue will also contain all the regular features such as BETTER BYTES, PROBLEM CORNER, INPUT/OUTPUT (Readers' leters), etc. In addition,, we will tell you all about a SPECIAL FREE OFFER TO ALL SUBSCRIBERS - AND REVEAL A SURPRISE ACCESSORY for your '80, that we've been working on and that you won't want to be without.

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MICRO-BUGS

Where we correct our output errors.

** OOPS! MY SLIP IS SHOWING! ** a correction by Peter Hartley.
There's a (horror of horrors) MISTAKE in the MINI MACHINE LANGUAGE SAVE ROUTINE IN BASIC that appeared in February.

The opening CLEAR statement should clear 550 bytes, and not 440. Probably you've spotted that already, but without that correction you'll get a lock-up before the second data dump.

My apologies folks.

** WHO WANTS TO WRITE IN BASIC ANYWAY ** a correction by Eddie Paay.
Unfortunately we have had to hold over the next part of my series on Assembly Language Programming until next month, but I must still apologise for the small BASIC program presented at the end of last month's article. Somehow some errors sneaked their way into it. I don't know how it happened as I had a working version in BASIC. I must have typed it into last month's article wrongly. The corrected version is listed below:

```
10 DATA 33,0,60,17,1,60,1,0,4,119,60,237,176,245
20 DATA 1,255,63,205,96,0,241,24,233
30 FOR X=20224 TO 20246: READ A :POKEX,A :NEXT X
40 POKE 16526,0: POKE 16527,79: X=USR(0)
50 END
```

As you will notice, the machine language part in lines 10 and 20 was correct. The faults where in the BASIC part. My apologies again, and watch out for next month's major article in the series. - (Sorry we were forced to hold it over. Ed.)

** RANDOM GENERATOR TEST PROGRAM No 2 - March issue **
The line numbers in the text which accompanied this program did not line-up with those in the listing. This occurred because the program was renumbered between the time that the text was written and the time the listing was printed. Please change the line numbers printed in the text as shown below:

	PRINTED AS	CHANGE TO
	260	160
	265	170
	270	180
	280	190
	200 & 310	90 & 230
	235	130
	4000	380
Routine	3120 - 3170	270 - 320
Routine	3180 - 3200	330 - 350

** INVADERS - March issue **
Line 9999 was printed as garbage. In the original program this was a REM Statement saying "END OF PROGRAM". This line is not necessary to the normal operation of the program. Please delete it.

** BETTER BYTES ** a potpourri of this and that, conducted by Peter Hartley.

DOS 2.3 still has a couple of odd errors that cause a headache from time to time. To use the MERGE function, requires one of the programs to be filed in ASCII. However, when you MERGE you may get a DIRECT STATEMENT IN FILE ERROR. This may not be so! If you write programs like mine, with >200 characters per line, that error statement comes up. Just edit the longer lines into two shorter ones, MERGE, and edit back. Perhaps one of our Hex wizz-kids could come up with a patch for DOS that would cure this?

Understand that some of our readers are having problems saving some of the MICRO-80 software onto disk, and on investigating discovered that they were saving as ASCII files (using the A option).
This facility of DOS isn't very good. In fact its got quite a few problems, as well as using up a lot of disk space.
Our advice is - don't bother with this unless you are trying to merge files. Many fine programs just won't file this way because of the above problem anyway.

I recently acquired a copy of an American "Adventure" program, called "Dunjonquest" (to be reviewed in a future edition).
The program came out with very detailed instructions for transferring it to disk. Only problem was that the tapes wouldn't load into a 32K '80!
No problems with 16K, but as soon as the expansion interface was connected - no load. (Yes, I did remember to CMD"T")
I even tried changing all the memory chips in the expansion, as we had experienced some really odd happenings in the past, but this made no difference.

Finally managed to relocate BMON, to reside with DOS, and loaded the problem tapes using the LOADER routine. Because BMON was not really designed to work with DOS, it was then necessary to re-boot, and go back to BASIC * (which leaves the program intact - with TRSDOS 2.3) before we could save to disk.
Has anyone out there had any similar problems, I wonder?
If nothing else it proved that anything is possible, and perseverence usually pays!

Error traps are fine if the program is entered correctly, but if you're prone to making mistakes at 2.30 in the morning, you should leave them out until you've checked the rest of the program.

The reverse - or negative - of any graphics block can be found by subtracting the ASCII of the block from 319. Thank our regular correspondent, Ron Sulley, for that one.

APOLOGIES for goofing up that border routine last month. Here is the correct version.

```
010  FOR VAR=0TO127: SET(VAR,0): SET(VAR,47): IFVAR<48 THEN SET(0,VAR):
SET(127,VAR)
020 NEXT
```

Readers contributions are not only invited - but requested - for this column.

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** PRESERVING TAPE DATA - AND
RECOVERING IT WHEN ALL SEEMS LOST ** by Peter Hartley

Writing $trings to cassette can be frustrating, especially when you come to test the data dumps and discover that all you get are F.D.ERRORs by the trillion. Don't blame the cassette, because the problem is likely of your own doing. All the manuals say that you cannot PRINT #-1 any $trings that contain any control characters, line feeds, commas, etc. ** BULL **
The real problem is that you cannot read them back again!!!!
UNLESS... PRINT #-1, CHR$(34);S$;CHR$(34)
In which case INPUT #-1,S$ will work a charm.
The only character that will defeat this is the quotation mark, so THAT you MUST leave out.
The other problem is how do you recover the data dumps that you goofed up last week, and the answer is easy - use the MERGE function of BMON, and you'll get a whole program-full of data that you thought you'd lost!

FINALLY, if you have rarely-used data tapes that are worth looking after, make a six-monthly date with yourself to rewind these, to minimise print-through. Make sure they are kept in a cool dry place, away from magnetic fields (T.V.'s, Radio speakers, etc).

STATIC ELECTRICITY can damage tape data - it is helpful to touch a sizeable chunk of metal prior to grabbing your favourite cassette. Sources of static may be minimised by using anti-static mats and sprays, humidifying the air, etc. Carpets are an especially effective generator of static, so it may help to relocate your "den".

** SIMPLE ROUTINE TO BLOCK MOVE
USING MONITOR-IN-BASIC OR T-BUG ** by Peter Hartley.

Neither T-BUG or any of the varieties of MONITOR-IN-BASIC that we have published are any use for loading Hex into low memory directly, but this seems to be what many of our readers want. Following our avowed intent of "give 'em what they want so long as they don't get called 'DUMMY'", here's the simple solution.

First of all, use one of the afore-named routines to enter your Hex where you don't want it - say from 6000H and up.
Now add the following coding to the end of the entered Hex - remembering that two byte numbers or addresses should be reversed in Hex E.G. 1357H is entered as 57 13

```
21 00 60   where 6000Hex is the start of the Hex you entered.
11 23 41   where 4123Hex is address from which you wanted the
           Hex to start.
01 12 23   where 2312Hex is the total number of bytes in the
           original hex entered.
   ED B0   the Z80 powerhouse LDIR block move instruction.
C3 56 41   where 4156Hex is the entry address of the Hex
           routine when it sits where it was intended.
```

Now make your system or monitor tape, with the start and the finishing addresses being where they were actually typed in, including the 14 bytes we've just added. The entry address for the system tape is the address of the first byte of the new 14 byte addition (i.e. where the 21 is located). Now, when the tape is loaded and you respond to the *> with / ENTER the m.l. routine should be block moved to the proper locations, and then execute automatically.

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** PROBLEM CORNER ** conducted by MICRO-80 resident hackers.

In christening the first of what we hope will become a regular feature of MICRO-80, perhaps our readers won't mind too much if we start with a little internal problem?

We are utterly delighted with the response from you all, by way of programs for publication. Quite overwhelmed - and that's the problem!! Please, please don't get anxious if we don't reply by return. Most of us here have other jobs to do - like earning a crust - as well as laying the groundwork for the future of MICRO-80 and its sister company MICRO-80 PRODUCTS. Sometimes we even have to take time out to mutter sweetly over our wives and offspring!

What I'm trying to say is "Sorry if we take a while answering mail, etc., but we're trying to improve things." In fact we've been buying additional disk drives, high-speed cassette duplicators, and generally bankrupting the business over the last few days - much to the horror of His wife - in a serious attempt to further improve the level of MICRO-80 service, and if everything goes like it has during the last couple of days, (and we don't run out of His money first), we might even be able to start bringing the publication dates forward by a few days each month!

There are a couple of ways that our budding authors could help us, too. If your writing looks as though an hallucinating spider has wandered around the page while cuddling a ball-point, then, for sanities sake, write us a program of REM statements, or find a typewriter, or ring us up late at night, talk into your cassette or something!

Always write your name and address on the cassettes you send, and always put a Copyright notice with your name and address at the front of your programs. That way, you'll be sure to get them back. Sometimes, phone numbers are useful, too. For those of you who don't understand this Copyright thing - the Copyright Act grants immediate copyright to the author of any work - as soon as its written. There's nothing to register, and no forms to fill in. Possibly, it may be appropraiate, in a few rare instances, to seek a patent on a program, but this will cost more than a few dollars and probably won't be worthwhile unless you really create artificial intelligence. The legal application of patents to computer programs is still a bit of a grey area.

PLEASE DON'T JUST SEND US A LISTING OF YOUR PROGRAM - we really do not have enough time at the present to study a listing from one end to the other. If we can load a cassette or disk, and see what the program is about, and it whets our appetite, then we'll get round to reading the listing. But no cassette or disk - sorry, no time.

With a monthly journal, we are never working on only one issue at a time. This piece is intended for the April issue, but on my desk, as I write, is most of the May issue, and great heap of material that is "maybe" for June and July. Obviously, from time to time, I'll get confused, and so will my colleagues.

Anyway, enough of that. YOUR problems.

The first started with a program we received from a reader in the Apple (not the micro) Isle. For a number of reasons we rejected his effort, and in replying mentioned that parts of his work showed a lack of knowledge of Level I. We set out a sample, and waited to get a reworked version of the program back.

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Imagine our surprise when we get, instead, a letter indicating that
(a) he didn't know of the routine we had suggested (which is fair enough)
(b) it isn't in the level 1 manual
(c) the tassie Tandy expert didn't know about it either

What was the routine? ON N GOSUB nnnn, nnnn, nnnnn,...

Well, I knew that I'd used it in level 1, so I reached for the level 1 manual and... guess what? The Index shows it to be in chapter 15. The "What we learned in this chapter" piece at the end of chapter 15, shows it, too. BUT it isn't in there!!!

So, all you level 1 fiends, out there, get this. Just as you can use
ON N GOTO nnnn, nnnn, nnnnn,....
as IS explained in chapter 15 of the manual, so too can you GOSUB in the same way. The abbreviated form is...
ONNGOS.nnnn,nnnn,nnnn

All of this brings us to the second problem, this time from W.A.

This reader wrote a really beaut program (which you'll probably see next month), again in Level I, and set some little four-line routines up as a subroutine. The program would work fine for a while, and then come up with HOW?

Now, to be quite fair, the version of the program we received, had these lines rewritten into the listing wherever they were needed, to get around this problem, so we had to do a bit of assuming. This is what we came up with.

The subroutine did not end with RETURN. Instead, it ended with GOTO nnnn. You can do that, and it may work. I often use a goto from a subroutine - but only to another subroutine, so that the RETURN in the second subroutine will RETURN to the ORIGINAL GOSUB statement.

What happens if you don't do it this way?

The stack continues to be loaded with the GOSUB address, each time the GOSUB is encountered, and the stack pointer is appropriately advanced each time. Since there just isn't another RETURN statement anywhere in the program, eventually the stack starts to write somewhere that it didn't 'ort to, or you run out of memory. Then HOW?

You should exit a subroutine with RETURN. If the subroutine is to determine where to go next, let the subroutine assign a value to a variable, and then the main program can use an ON N GOTO nnnn, nnnnn, nn, routine.

Incidently, the reader concerned did write to TANDY about this problem. They replied to the effect that they didn't know the answer. I hope that this doesn't mean that they are losing interest in the level 1 customers, because I've had occasion to ring Mal Williams in Sydney several times with some fairly curly problems, and have always been met with very courteous help, and, generally, a very prompt return call.

Well, that's it for the first of these columns. If you've got a curly one, hurl it in. We don't promise to come up with the answer, but we'll try.

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** NEW BRAND OF DATA TAPE - REVIEWED **

Those of us who are still cassette-bound will know the frustrations of using the wee little beasties - a colleague recently said that the worst thing about the cassette is the sheer frustration of not being able to do anything except blow your nose and have a cuppa while they do their thing. I supplied him with a clockwork cassette - fitted with a special short spring - and he feels a lot better now!

Seriously, though, the quality of the tape you use can have a big impact on the viability of the cassette system.

The Dick Smith cassette is rapidly taking on the etheric qualities of a Greecian Myth, and the Tandy one is not as cheap as it should be, to say nothing of the difficulties I've experienced re-recording with this brand.

The alternatives are either expensive and still not as good as they should be for the price, or cheap and, frankly, quite nasty.

When I had the opportunity to test one of the new Scotch brand Computing Cassettes, I was midway through an excercise that relied heavily on cassette data - no better test.

The cassette came in an unusual open-ended rigid clear-plastic sleeve instead of the more usual hinged box. That, I thought was a small sign of original thought, anyway. The sample tape was fitted with clear leaders and the cassette itself, stomped 'made in USA' was of the welded type, quite un-unscrewable, which various manufacturers claim to be good or bad according to what their product uses.

The real test of the mechanism was a series of fast winds and rewinds, which refused to raise as much as a squeak or rattle from the device.

The tape itself showed nothing but quality - obviously finely calandared (sifted) ferro-magnetics are used, and the recording face of the tape is very, very, highly polished.

Using PRINT #-1 routines, I used one side of the sample to transfer 64K of data. This involved recording a full side, and then reading it back for checking, and then repeating the process a further two times. Not a single bit was lost, even when re-recording over previous data.

The cassette features a magnetic shield behind the record-head window, as is standard, but the felt pad is unusual. Instead of the conventional arrangement, where a small felt pad is mounted on a bronze spring-arm, the Scotch product bears a double-sized pad, fixed to a foam-rubber mount. This offers greater reliability - the bronze springs are very brittle and prone to snapping - and greater pressure against the record-head. Clearly this would not be possible with a tape less well polished, and the data tests clearly demonstrated the efficiency of the system.

To sum up then - a quality product from a company with a reputation for quality products, that will greatly enhance casstte operations.

P.H.

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****** HARDWARE SECTION ******

***** LOWER CASE AND OTHER SURPRISES *****

by Peter Hartley.

*** WARNING ***

Although many hundreds, if not thousands, of '80's have been modified in the manner outlined in this article, we must emphasise that neither the author, nor the publishers of MICRO 80, can be held liable for any damage or loss occasioned by the use or installation of the modifications outlined here. THIS MODIFICATION WILL VOID YOUR WARRANTY AND IS NOT COMPATIBLE WITH THE TANDY WORD PROCESSOR. (The Tandy word processer modification is not compatible with the Electric Pencil and has been designed purely to work with SCRIPSIT. The Tandy modification will sell in Australia for $99.95 plus $20.00 installation! The modification described here will cost well under $10.00)

The character generator used in the '80 holds much more than the 64 characters you normally see. The dedicated video memory of your '80 is set up as 1K of seven-bit memory. Bits 0 to 5 are used for character selection, and bit 7 is used as a toggle to select alphanumerics or graphics. There is no video memory storage for bit 6. As a result, the memory for each screen print-position can store only values between 0 and 63, and between 128 and 191.

In order to access all the other goodies we must either change bit seven to bit six, or add suitable storage for bit six. The latter choice is more usually adopted, and we follow that course here. Those of our readers who have already adopted the "Electric Pencil" modification will note that our version appears somewhat different. In fact, this modification is electrically identical, but offers greater reliability with reduced risk of damage to the p.c. board.

As well as giving access to the lower case equivalents of the normal character set, you will also aquire a host of new graphics. You will, however, find that those letters with lower hangers (q y p g j) will look wrong, owing to their being raised up on the line. This is because the '80 blanks out that part of the text line usually occupied by lower hangers. Nevertheless, those of you with printers will find that the only thing odd about your printer output will be caused by the printer itself. Some '80's also throw the "a" up slightly. I don't know why that should be, or what can be done about it. (Maybe someone out their may be able to assist on this one?) It does not take much getting used to, anyway, and only happens in a few instances.

You will require a low-power, 450 nanosecond, 21L02A memory chip, (21L02A or 2102L or LS2102A, not a standard 2102A), some fine flexible insulated wire, and a small single-pole dual-throw switch. MICRO-80 PRODUCTS can supply a complete kit for $5.50 plus 50c p&p.

In order to eliminate any possibility of damage from static, your soldering iron should be of a low voltage type. Even if the iron runs from a transformer, take the precaution of earthing the bit. Irons using a carbon element (i.e. Scope type) are not suitable.

Find a spot to work where you will be able to spread out without risk of being "told" to move for a couple of hours. If this "safe" spot is carpeted - move! Too much static!

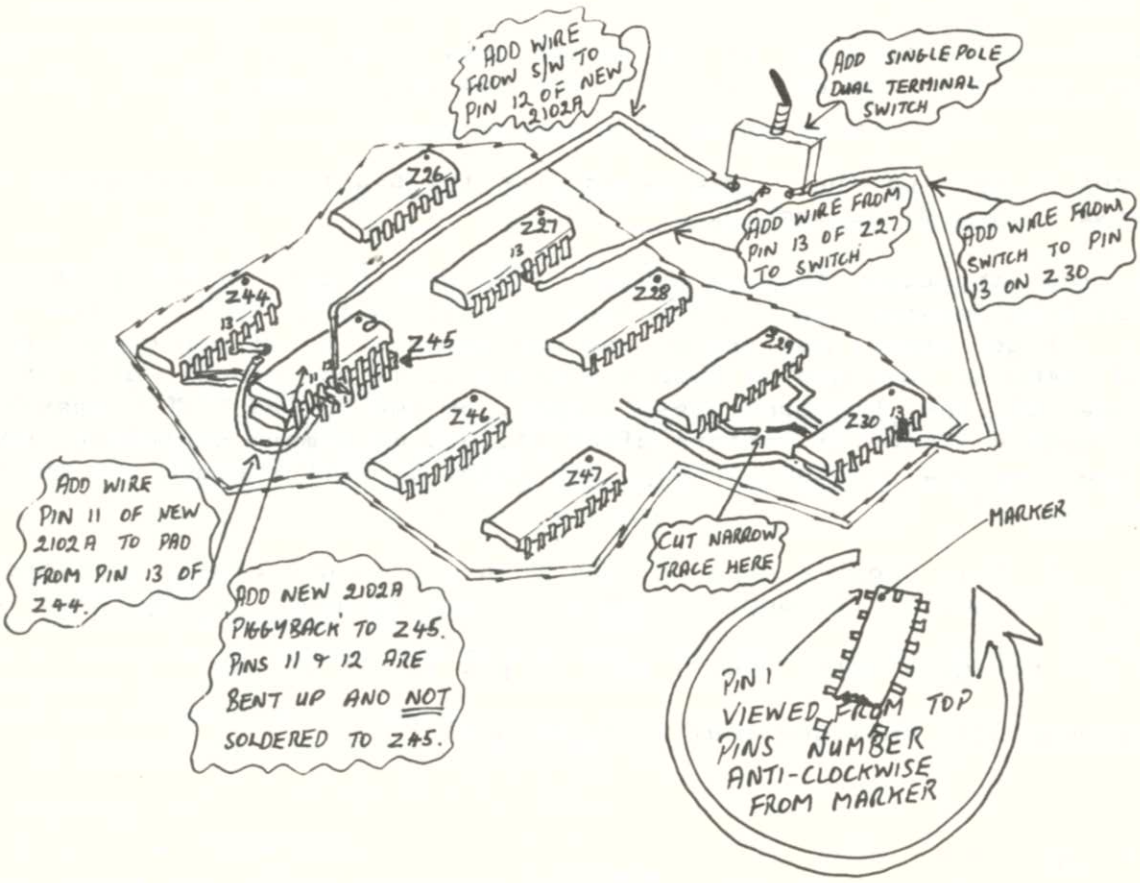
Having disconnected your '80 from the rest of the world, upturn it and remove the six screws from the base - noting that there are three sizes, and which goes where. With the '80 right-way-up again, remove the upper cover. Carefully lift the keyboard assembly ABOUT 1/4 INCH ONLY, and then roll it over towards you. The keyboard is attached by a strip of flexible printed circuit on the left-hand side. Frankly, I think this is disgraceful. It has a ready tendency to crack and is unreliable. I have replaced mine with a length of ribbon cable. There should be provision for a cable connection with plugs and sockets at each end. At present there isn't enough room. TANDY PLEASE NOTE!

Again noting where they come from, remove the circular silicon rubber spacing washers. The main board should now lift free. Roll the board towards you so that it lies on top of the upturned keyboard.

If you have any doubts about the dissassembly or reassembly of your '80, obtain a copy of the Technical Manual from your local Tandy Store. It is a reasonably good, and very fairly priced publication, even though the circuit diagrams are often very very wrong!

Now you must locate that part of the board which is shown in the illustration

You will see two copper tracks running between Z29 and Z30. Cut the narrow one of these with a small sharp knife. A Stanley Knife is ideal. N.B. You only need to cut a tiny slither from the track - not a dirty great slot in the board!



Those who haven't worked with i.c's before will need to know how the pins are numbered. With the pins downward, one end of the case is coded. Usually the marking is a tiny hole over one corner - the nearest pin is number 1. If this hole is missing, one end will have a semicircular recess. The first pin, moving anti-clockwise from the recess, is Pin 1.

Having located Pin 1, the rest of the pins number anti-clockwise from there. Some of the chips we will be playing with have 14 pins, and some 16 - so, for example, Pin 13 on Z30 is not in the same place as Pin 13 on Z27. Be careful!

Carefully bend pins 11 and 12 of the new 21L02A so that they stick out at right-angles to the rest. Now, using as little heat and as little solder as possible, tin the INSIDES of the other pins, and the OUTSIDES of the pins of Z45. Now, making sure that Pin 1 lines up with Pin 1, push the new chip, piggyback style, over the top of Z45. You shouldn't have to use any additional solder, and only the tinyest amount of heat, to solder pins 1 to 10, and 13 to 16, of the two chips together, but look out for runs and possible shorts between the pins!

Solder a short length of wire from Pin 11 of the new chip to the pad at the end of the copper trace that runs from pin 13 of Z44.

You should now decide where to mount the switch - and with a suitable drill make a hole in the case. Mine is mounted on the top, just left of the <↑> key and above the up-arrow key. The Editor has his on the centre of the rear sloping face of the case top. Wherever you decide, the switch can be installed at this point.

The wire from the centre terminal of the switch goes to pin 13 of Z27. The others go to pin 13 of Z30 and pin 12 of the new chip. Guess what? YOU'VE FINISHED!

Now you can put it all together again, ready for the big test. Reassembly is just the reverse of the dissassembly.

On power-up, try throwing the new switch. You should get, in one position only, a very strange message, and in the second position the normal power-up messages.... if you cannot get any of the new symbols, or if you cannot get any of the old symbols, then you've made a mistake!.. if you cannot get into BASIC, or some of the keyboard doesn't work, or the MEMORY SIZE ? message comes complete with a string of letters after it, you've almost certainly got a break in the flexible printed circuit, and might as well replace the whole strip with real wires!

Unfortunately, if this doesn't cure things, then you've got bigger problems. Check for shorts, solder balls, odd bits of wire rocking about inside, etc.

Assuming that all has gone well, you'll want to put it all to use.

This little program will show you what's inside now!

```
010 CLS
020 M=15360
030 FOR K=0 TO 191
040 POKE M,K
050 M=M+2
060 NEXT
```

```
070 FOR T=0 TO 2500
080 NEXT
090 PRINT CHR$(23);
100 FOR T=0 TO 2500
110 NEXT
120 PRINT CHR$(28);
130 GOTO 70
```

This one will give keyboard access to lower case by shifting the appropriate key.

```
010 REM *** PROTECT MEMORY AT 32737 ***
020 POKE 16553,255: REM *** SOME '80S NEED THIS BEFORE
    READING ANY DATA STATEMENTS - OTHERS ONLY NEED IT
    AFTER EXECUTING AN "INPUT#-1" STATEMENT
    -SOME LUCKY PEOPLE DON'T NEED IT AT ALL!!
030 FOR I%=32738 TO 32767
040 READ D%
050 POKE I%, D%
060 NEXT
070 POKE 16415, 127: POKE 16414, 226
080 DATA 221,110,3,221,102,4,218,154,4,221,126,5,183,40,1,119
090 DATA 121,254,32,218,6,5,254,128,210,166,4,195,125,4
100 END
```

You will notice that the only way to control the new graphics will be by poking them directly into video memory. Otherwise, of course, many control characters wouldn't work, which would make life difficult to say the very least.

I understand that Eddie Paay has worked out how to make the keyboard work with upper and lower case the right way round - as on a normal typewriter - so look out for that in a future issue!

We hope you'll have a lot of fun with all the new characters!

***** READER'S REQUESTS *****

This column is a regular feature of MICRO-80. In it, we list all those things, articles, programs, etc., requested by our readers. We try to work our way through the list as time permits, but if you would like to contribute an article or program, look here for an idea of what our readers want to see.

** ARTICLES **
File handling on the '80
Description of the functions performed by the Expansion Interface
Reviews of '80 compatible printers
Reviews of commercially available software (including that produced by us!)
Reviews of commercially available hardware

** SOFTWARE **
GAME OF LIFE relocated to start at 7000H
A m.l. program to enable the break key to work like RESET when using an expansion interface
PRINT #-1 & INPUT #-1 speedup
Hex to Dec to Hex conversion routines

** HARDWARE **
RS232 printer interface
Interfacing the '80 to external hardware

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***** THIS MONTH'S SOFTWARE *****

**** BMON -- PART 3 -- **** by Eddie Paay

This months installment on BMON will enable the last 4 commands:- RESTORE BASIC PROGRAM, LIST VARIABLES, DECIMAL TO HEX. AND HEX. TO DECIMAL conversions. All that is required is to load the part published last month and add this months part to it . It can then be saved to tape, the program should now be complete all commands should work satisfactory.

LIST VARIABLES.
This command will give an alphabetic list of all variables used in the resident basic program.

RESTORE BASIC PROGRAM.
This will restore a basic program if "NEW" has been typed accidently provided it is used immediately after the "NEW" statement was used.

DEC. TO HEX.
This allows the user to do decimal to hex. conversions, it will convert decimal values up to 65535 to a four digit hex. value, if the decimal value is less than 5 digits use the enter key to terminate it.

HEX TO DEC.
This allows the user to convert four digit hex. values to decimal. The hex value must always be four digits long, the number 1 for instance must be entered as 0001.

The listings in the back of this edition show only those changes which are required to last month's listing to make your copy of BMON complete. I hope you find it useful.

** HORSE RACE ** (L1/4K) by Tony Fraser.

This one is a lot of fun for the family. Four horses actually race along a track, while a pseudo race call prints along the top of the screen. Ideal for those rainy weekends when the telly's on the blink.

** ONE ARMED BANDIT by Andrew Bloss, (age 15) (Level 1/4K)

Written into 2477 bytes of level 1, by a fifteen-year-old lad, and complete with a "moving one arm", this ain't at all bad. The writing is concise and uncluttered, and the program works well. To be fair, the reels are not arranged like the real reels (ah, the alliterations that flow in the early hours!), so the device can be a bit over-generous at times, but what 15 year-olds do know how the real reels are arranged to "fix" the odds, anyway. Just type it in, CS. it and the RUN. It's good clean honest fun, and works well.

Congratulations Andrew! Perhaps this will encourage some of our other young "hackers" out there to go through their cassettes?

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** BANDIT ** (L2/4K) by John Massara

This is an amazingly simple level 2 version of the three reeler wheeler dealer. Very simple, but effective. We felt, again, that this version too is on the generous side, but the author insists that that's the way its meant to be - to keep the interest up.
Each reel is loaded with fifteen symbols: 4 TENS, 3 QUEENS, 3 JACKS, 3 KINGS and 2 ACES. This can easily be changed by altering the DATA in lines 330 and 340, but keep to 15 symbols per reel. Payouts are set in lines 230 to 310.
If any member of your family has a love of the pokies - the housekeeping is now safe. (There again, if your family is problem-free, this might just give someone the bug to try for reel(?))

** KRAZY KAT (L2/16K/4K) - by Ronald J. Sully **

The game is definately NOT for those who get upset at their own inability (or pure bad luck)!
As published, the game presents a series of eight mazes, a mouse "*" and a very KRAZY KAT which the player attempts to control with the arrow keys. There are three levels of play, and a limit on the number of moves the perplexing pussy can make in any maze at any level.
Those readers with only a 4K system can squeeze out a maze or two, and make the necessary ajustments to lines 430 and 5100.
The more adventurous, with memory to burn (the published listing occupies 5171 bytes) can create additional mazes, if they get the urge to be creative!
If you want to vary the difficulties at any level, play with lines 220 (where the Kraziness factor K is set), and 2520 (where RND(K) does its thing).

Ron reckons that if you liked SNAKE (issue 1 - back-copies still available - Ed.) you'll love KRAZY KAT. The author of SNAKE bows to Ron's abilities.

** MOVIE MAKER ** (L2/4+K) by Charlie Bartlet

Movie Maker is a Basic GRAPHICS ASSEMBLER (GRASS for short) which resides temporarily in memory between lines 50000 and 50600. GRASS pokes token values into your program, where they replace characters in a string. This means that there must, first off, be a dummy string into which to these tokens can be poked.

GRASS graphics is the fastest graphics system outside of machine language. To operate GRASS simply RUN 50000 and you are in GRASS Command Mode.

The Commands are

A	ASSEMBLE
B	BASIC
C	CODES
D	DESTROY
E	EXAMINE

**Input A GRASS will respond with "WHICH LINE NUMBER?". You now enter the line number of your program which contains the dummy string. You can use any valid line between 1 and 49999, and GRASS does check for erroneous line numbers. GRASS responds to a valid line number with

POS$ VAL$ CHR$ NEW

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POS$ is the location of the first byte in the line.
VAL$ is the decimal value of that byte.
CHR$ shows (i) how that byte would appear in a string if VAL$ is between 32 and 191
(ii) if the byte is a control character (0 - 31)
or (iii) if the byte is a space-compression code (192 - 255)

A question mark appears under NEW to prompt you to enter one of the following:-

<ENTER>	leaves byte unchanged and displays the next
1 to 255	to replace the old value with that entered
The up arrow	to display the previous byte (unless the byte is the first byte of the line)
0	to exit from assembly mode before you reach the end of the line

Note that consecutive graphics characters are staggered to make them easier to identify - this also applies to the CHR$ column .

**Input B Exit from grass and back to BASIC.
*** WARNING *** Don't try to edit GRASS strings with the BASIC EDITOR or you will get garbage. Only edit in GRASS mode.

**Input C Offers the options of...
(i) displaying all the graphic characters with their codes
(ii) displaying all the space compression codes
(iii) displaying all the control character codes

**Input D Destroys GRASS, leaving all your carefully created strings intact, and ready to run.
*** WARNING *** CSAVE the composite first, just in case!!!!

**Input E Displays the last string assembled or edited in one composite whole. To display other strings, enter Assembler mode, input the line number for the appropriate string, enter 0 to exit, and then E for examine. The complete string will be displayed, complete with the delimiters which will be a part of your program, but which will not be displayed in normal operation. The name of the string will be displayed on the left of the screen.

GRASS is not intended to reside permanently alongside YOUR program Just use it to assemble the strings you need, and then destroy it. When you list your program you will see that the GRASS strings contain token words and assembler symbols. The program may jump all over the screen when you list it, but this is not the way the strings will appear when you RUN - UNLESS YOU ATTEMPT TO EDIT THE STRINGS WITH THE BASIC EDITOR!

With practise you will be able to make single strings cover several display lines with graphics. If you type

```
?50-FRE(A$)
```

you will get 0 - SHOWING THAT GRASS STRINGS DO NOT USE AVAILABLE STRING SPACE!

You will find a chart of all the standard graphic characters on the inside of the back cover of this issue.

O.K. NOW, lets get this show on the road...
1) Enter GRASS, and CSAVE it for future use.
2) Enter this program - EXACTLY AS LISTED.

```
005 CLS:R=100
010 A$="PLEASE ENTER EXACTLY AS PRINTED THANKS!"
020 B$="PLEASE PLACE YOUR DUMMY STRING HERE THANKS"
030 C$="THIS IS A DUMMY STRING FOR GRAPHICS!!"
045 P=64:CLS
050 P=P+1@P,C$:P=P+1:GOSUB100:PRINT@P,B$:P=P+1:GOSUB100:
    PRINT@P,A$:P=P+1:GOSUB100:IFP=112THEN45ELSE50
100 FORX=1TOR:NEXT:R=R-1:RETURN
```

3) Type RUN50000 to get into GRASS
4) Type A
5) Answer line number with 10, and key in the following...

POS$	VAL$	CHR$	NEW	
17145	65	A	?	press enter
17146	36	$	?	press enter
17147	213	SPCOMP21	?	press enter
17148	34	SPCOMP21	?	press enter
17149	80	P	32	
17150	76	L	152	
17151	69	E	171	
17152	65	A	191	
17153	83	S	191	
17154	69	E	191	
17155	32		191	
17156	69	E	191	
17157	78	N	135	
17158	84	T	131	
17159	69	E	129	
17160	82	R	27	
17161	32		24	
17162	69	E	24	
17163	88	X	24	
17164	65	A	24	
17165	67	C	32	
17166	84	T	168	
17167	76	L	176	
17168	89	Y	144	
17169	32		26	
17170	65	A	26	
17171	83	S	24	
17172	32		24	
17173	80	P	24	
17174	82	R	24	
17175	73	I	24	
17176	78	N	24	
17177	84	T	24	
17178	69	E	24	
17179	68	D	24	
17180	32		24	
17181	84	T	32	
17182	72	H	32	

DALEK CHASE (L2/16K & up) $15.00 + 50c p&p.
An absorbing game in which you save Dr Who from persuing Daleks. The better you play, the harder it gets (and vica versa). Infinate range of play levels from HARD to UTTERLY IMPOSSIBLE, and comes complete with messages of praise and mediocre insults. (If you are really bad enough at this game, it actually refuses to play any more!) ENTHRALLING FUN FOR ALL.

AIR RAID $13.95 + 50c p&p
An arcade type action game, utilising the high speed capabilities of machine language. Aircraft fly by at seven different altitudes while you aim your missile launcher and try to blast them out of the sky. Complete with debris and hard to hit parachute targets; time left, score and high score to date displays; nine degrees of difficulty; and demonstration mode. Air Raid will provide hours of entertainment. ** LIMITED QUANTITY IN STOCK ONLY

** Coupon duplicate appears on inside back page *

* Coupon prices are inclusive of post & packing *

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RPN CALCULATOR (L2/16K & L2/32K) $24.95 +50c p&p.
Give your computer the power of a $650 reverse polish notation calculator with 45 functions and selectable accuracy of 8 or 16 digits. The main stack and registers are continuously displayed, whilst the menu is always instantly accessible without disturbing any calculations or register values. The cassette NOW comes with both the 16K and 32K versions, the latter giving you the additional power of a programmable calculator. Comes with a very comprehensive 15 page manual, which includes instructions to load and modify the 32k programmable version to run in 16K. Whether for everyday, or occasional use, this package will prove invaluable, and turn your '80 into a very powerful instrument.

TOUCHTYPE (L2/4K) $19.95 +50c p&p.
An interactive, 22 lesson typing course which uses the computer's keyboard and screen to teach you to type rapidly and accurately, and a massive cassette data dump to control your progress. The computer checks for accuracy, and sets timed excercises to check your progress. If you have to look at each key before you press it, or only use two fingers, then this program, plus a little perseverence, will do some amazing things to your typing speed.

LOWER CASE MOD. KIT $5.50 + 50c p&p
Complete in every regard, comes with prime quality makers speciication low power memory chip, switch, wire, and very detailed instructions. Easy to install, and a lot less expensive that the TANDY modification. Stop your '80 from holding out on you, and get your kit TODAY.

LEARNING LEVEL II (book) $16.95 + $1.20 p&p
By the author of the acclaimed Tandy Level I handbook, this reveals the secrets of Level II in the same inimitable style. Bright, breezy, easy to read and understand throughout, it is not only a book in itself, but contains pages to cut out and paste into the Level I manual, converting that to Level II, too! Just reprinted, and specially air-freighted in from the U.S. for YOU, to help you get the most from your '80.

RSM-2D: DISK BASED MONITOR/DISASSEMBLER $29.45 + 50c p&p
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```
POS$     VAL$     CHR$     NEW
17183    65       A        149
17184    78       N        32
17185    75       K        32
17186    83       S        32
17187    33       !        149
17188    34       "        ?       press enter
```

GRASS automatically exits from assembly mode when it reaches the last byte in the line, or your can force it to exit by entering 0. If you make a mistake the up arrow will cause it to backstep. If you now type E you will be able to see if you have made any mistakes.

6) Using the same format, load in the vaules listed below for lines 20 and 30. When you have finished, CSAVE, type D to remove the assembler and RUN. You should see next year's Melbourne Cup Winner having a practise!

Line 20: 32,152,171,191,191,191,191,191,135,131,129,27,
24,24,24,24,32,168,176,144,26,26,24,24,24,24,24,24,24,24,
24,24,32,152,129,32,32,32,137,144,32,32

Line 30: 32,152,171,191,191,191,191,191,135,131,129,27,24,
24,24,24,32,168,176,144,26,26,24,24,24,24,24,24,24,24,24,
32,137,144,32,152,129

*** BMON - Eddy Paay's masterpiece completed ***

```
LD    HL,7249H      7240  214972
LD    (7229H),HL    7243  222972
JP    7786H         7246  C38677
CALL  7345H         7249  CD4573
JR    728EH         724C  1840
CP    20H           724E  FE20
JP    Z,77D2H       7250  CAD277
JP    7791H         7253  C39177
```

To complete your copy of BMON, simply insert the routine set out above, and make the changes listed to the right. The loading addresses are from 7256Hex to 7EFEHex; the entry address is 7B99Hex, and Memory Protect level is 7210Hex (29200 Decimal).

We all think that BMON is the Greatest Basic Monitor we've ever come across, and hope you agree. (Perhaps it should be renamed GBMON? Ed.)

```
7265 FF   7539 25   781D 01
7266 71   7547 25   782E 27
728B C3   7554 25   784E 27
728C 40   7557 2A   789A CD
728D 72   7558 A4   789B C9
72F6 FF   7559 40   789C 01
72F7 FF   759F 12   79F7 1C
72F8 FF   75AB 15   7A17 1C
72F9 FF   75B6 29   7A27 29
72FA FF   7623 27   7A35 2B
73AF 14   7657 27   7A40 2D
73C4 14   76C1 CD   7A4D 2F
73D3 14   76C2 C9   7A7A 2B
73FC 29   76C3 01   7A7E 29
7415 12   76C7 1C   7AA2 10
7420 17   7703 00   7AA5 2F
744A 17   771E 1C   7AC0 29
7452 15   774A 1C   7AFA 2B
7469 17   7772 12   7B05 10
74A0 23   7776 15   7B10 2D
74A5 1B   777A 12   7BD2 0E
74AB 17   77CB 15   7BD5 0C
74B2 12   77CE 29   7BDC 15
74BD 20   7819 4E   7CE5 10
74C3 1C   781A 72   7CFC 10
7500 17   781B CD   7D6C 0E
751E 1C   781C C9   7D73 D4
                    7EFE 00
```

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*** HORSE RACE *** L1

```
 10 A$=GAZEBO
 20 B$=HOWIE
 30 CLS:PRINT"TYPE IN A NUMBER BETWEEN 2 AND 20."
 40 INPUT"THE LARGER THE NUMBER THE QUICKER THE RACE";R
 50 CLS:PRINTAT455;"ABS";:PRINTAT583;A$
 60 PRINTAT711;"LOT";:PRINTAT839;B$
 70 FORY=22TO40STEP6:FORX=28TO127STEP5:SET(X,Y):NEXTX:NEXTY
 80 FORX=1TO10:FORY=18TO42:SET(X,Y):NEXTY:NEXTX
 90 FORY=15TO47:SET(127,Y):NEXTY
100 A=129:B=136:A(3)=18:C=9:A(4)=20:D=19:E=1:G=129:H=136
110 Y=26:J=25:K=1:M=129:N=136:A(2)=30:O=9:A(1)=32:P=31:Q=1
120 S=129:T=136:X=36:U=9:L=38:V=37:W=1:A(5)=24:I=9
200 IF(E<117)*(K<117)*(Q<117)*(W<117)GOTO300
210 IFE>=117PRINTAT25;"ABS  WINS"
220 IFK>=117PRINTAT25;A$;"  WINS"
230 IFQ>=117PRINTAT25;"LOT  WINS"
240 IFW>=117PRINTAT25;B$;"  WINS"
250 PRINTAT130;"IF YOU WANT ANOTHER RACE TYPE 1 IF NOT TYPE 2";:INPUTZ
260 IFZ=1GOTO30
270 CLS:PRINTAT468;"BYE FOR NOW":FORZ=1TO2000:NEXTZ:CLS:END
300 Z=RND(8):F=RND(R)
310 ONZGOTO400,500,600,700,400,500,600,700
400 RESET(A,A(4)):FORZ=1TO8:RESET(E,D):E=E+1:NEXTZ
410 E=E-1:RESET(B,A(4)):RESET(C,A(3)):RESET(C+1,A(3))
420 C=C+F:E=E+F:A=A+F:B=B+F
430 SET(C,A(3)):SET(C+1,A(3)):SET(B,A(4))
440 FORZ=1TO8:SET(E,D):E=E-1:NEXTZ
450 E=E+1:SET(A,A(4)):GOTO1500
500 RESET(G,Y):FORZ=1T.8:RESET(K,J):K=K+1:NEXTZ
510 K=K-1:RESET(H,Y):RESET(I,A(5)):RESET(I+1,A(5))
520 I=I+F:K=K+F:G=G+F:H=H+F
530 SET(I,A(5)):SET(I+1,A(5)):SET(H,Y)
540 FORZ=1TO8:SET(K,J):K=K-1:NEXTZ
550 K=K+1:SET(G,Y):GOTO1500
600 RESET(M,A(1)):FORZ=1TO8:RESET(Q,P):Q=Q+1:NEXTZ
610 Q=Q-1:RESET(N,A(1)):RESET(O,A(2)):RESET(O+1,A(2))
620 O=O+F:Q=Q+F:M=M+F:N=N+F
630 SET(O,A(2)):SET(O+1,A(2)):SET(N,A(1))
640 FORZ=1TO8:SET(Q,P):Q=Q-1:NEXTZ
650 Q=Q+1:SET(M,A(1)):GOTO1500
700 RESET(S,L):FORZ=1TO8:RESET(W,V):W=W+1:NEXTZ
710 W=W-1:RESET(T,L):RESET(U,X):RESET(U+1,X)
720 U=U+F:W=W+F:S=S+F:T=T+F
730 SET(U,X):SET(U+1,X):SET(T,L)
740 FORZ=1TO8:SET(W,V):W=W-1:NEXTZ
750 W=W+1:SET(S,L):GOTO1500
1500 IF(K>Q)*(K>E)*(K>W)GOTO1750
1510 IF(Q>E)*(Q>K)*(Q>W)GOTO2000
1520 IF(W>E)*(W>K)*(W>Q)GOTO2250
1530 PRINTAT65;"1 ABS"
1550 IF(Q>K)*(Q>W)GOTO1590
1560 IF(W>K)*(W>Q)GOTO1610
1570 PRINTAT80;"2 ";A$
1580 GOTO1630
1590 PRINTAT80;"2 LOT"
1600 GOTO1660
```

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```
1610 PRINTAT80;"2 ";B$
1615 IFK>QPRINTAT95;"3 ";A$;:PRINTAT110;"4 LOT"
1620 IFQ>KPRINTAT95;"3 LOT";:PRINTAT110;"4 ";A$
1625 GOTO200
1630 IFQ>WPRINTAT95;"3 LOT";:PRINTAT110;"4 ";B$
1640 IFW>QPRINTAT95;"3 ";B$;:PRINTAT110;"4 LOT"
1650 GOTO200
1660 IFK>WPRINTAT95;"3 ";A$;:PRINTAT110;"4 ";B$
1670 IFW>KPRINTAT95;"3 ";B$;:PRINTAT110;"4 ";A$
1680 GOTO200
1750 PRINTAT65;"1 ";A$
1760 IF(W>Q)*(W>E)GOTO1800
1770 IF(E>Q)*(E>W)GOTO1820
1780 PRINTAT80;"2 LOT"
1790 GOTO1860
1800 PRINTAT80;"2 ";B$
1810 GOTO1890
1820 PRINTAT80;"2 ABS"
1830 IFQ>WPRINTAT95;"3 LOT";:PRINTAT110;"4 ";B$
1840 IFW>QPRINTAT95;"3 ";B$;:PRINTAT110;"4 LOT"
1850 GOTO200
1860 IFW>EPRINTAT95;"3 ";B$;:PRINTAT110;"4 ABS"
1870 IFE>WPRINTAT95;"3 ABS";:PRINTAT110;"4 ";B$
1880 GOTO200
1890 IFQ>EPRINTAT95;"3 LOT";:PRINTAT110;"4 ABS"
1900 IFE>QPRINTAT95;"3 ABS";:PRINTAT110;"4 LOT"
1910 GOTO200
2000 PRINTAT65;"1 LOT"
2010 IF(E>W)*(E>K)GOTO2050
2020 IF(K>W)*(K>E)GOTO2070
2030 PRINTAT80;"2 ";B$
2040 GOTO2110
2050 PRINTAT80;"2 ABS"
2060 GOTO2140
2070 PRINTAT80;"2 ";A$
2080 IFW>EPRINTAT95;"3 ";B$;:PRINTAT110;"4 ABS"
2090 IFE>WPRINTAT95;"3 ABS";:PRINTAT110;"4 ";B$
2100 GOTO200
2110 IFE>KPRINTAT95;"3 ABS";:PRINTAT110;"4 ";A$
2120 IFK>EPRINTAT95;"3 ";A$;:PRINTAT110;"4 ABS"
2130 GOTO200
2140 IFW>KPRINTAT95;"3 ";B$;:PRINTAT110;"4 ";A$
2150 IFK>WPRINTAT95;"3 ";A$;:PRINTAT110;"4 ";B$
2160 GOTO200
2250 P.AT65;"1 ";B$
2260 IF(K>E)*(K>Q)G.2300
2270 IF(Q>E)*(Q>K)G.2320
2280 P.AT80;"2 ABS"
2290 G.2360
2300 P.AT80;"2 ";A$
2310 G.2390
2320 P.AT80;"2 LOT"
2330 IFE>KP.AT95;"3 ABS";AT110;"4 ";A$
2340 IFK>EP.AT95;"3 ";A$;AT110;"4 ABS"
2350 G.200
2360 IFK>QP.AT95;"3 ";A$;AT110;"4 LOT"
2370 IFQ>KP.AT95;"3 LOT";AT110;"4 ";A$
2380 G.200
```

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```
2390 IFE>QP.AT95;"3 ABS";AT110;"4 LOT"
2400 IFQ>EP.AT95;"3 LOT";AT110;"4 ABS"
2410 G.200
```

*** BANDIT *** L1

```
5 GOS.31200
10 CLS
20 F.X=20TO108:F.Y=6TO21
30 S.(X,Y):N.Y:N.X
40 F.X=24TO48:F.Y=12TO18
50 R.(X,Y):N.Y:N.X
60 F.X=52TO76:F.Y=12TO18
70 R.(X,Y):N.Y:N.X
80 F.X=80TO104:F.Y=12TO18
90 R.(X,Y):N.Y:N.X
91 F.X=28TO100:F.Y=21TO42
92 S.(X,Y):N.Y:N.X
95 F.X=50TO78:F.Y=23TO34
100 R.(X,Y):N.Y:N.X
110 GOS.30000
111 GOS.31000
112 P.A.4;:IN."TYPE IN YOUR BET AND PRESS ENTER TO ROLL ---> $";P
114 P.A.4;" "
115 GOS.30050
120 D=RND(5)
121 G=0:K=0
123 A=336
125 F.R=1TO3
130 P.A.A;"ACE";
135 GOS.20000
140 P.A.A;"KING";
145 GOS.20000
150 P.A.A;"QUEEN";
155 GOS.20000
160 P.A.A;"JACK";
165 GOS.20000
170 P.A.A;"TEN";
175 GOS.20000
180 N.R
190 IFK=1T.250
195 IFK=2T.290
200 ONDGOS.300,310,330,360,400
232 T=RND(5)
240 A=350
245 K=1:G.125
250 ONTGOS.300,310,330,360,400
260 F=RND(5)
270 A=364
280 K=2:G.125
290 ONFGOS.300,310,330,360,400
295 G.770
300 P.A.A;"ACE";
303 GOS.20000
305 RET.
310 P.A.A;"ACE";
```

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```
315 GOS.20000
320 P.A.A;"KING";
323 GOS.20000
325 RET.
330 P.A.A;"ACE";
335 GOS.20000
340 P.A.A;"KING";
345 GOS.20000
350 P.A.A;"QUEEN";
353 GOS.20000
355 RET.
360 P.A.A;"ACE";
365 GOS.20000
370 P.A.A;"KING";
375 GOS.20000
380 P.A.A;"QUEEN";
385 GOS.20000
390 P.A.A;"JACK";
393 GOS.20000
395 RET.
400 P.A.A;"ACE";
405 GOS.20000
410 P.A.A;"KING";
415 GOS.20000
420 P.A.A;"QUEEN";
425 GOS.20000
430 P.A.A;"JACK";
435 GOS.20000
440 P.A.A;"TEN";
443 GOS.20000
445 RET.
770 IF(D=1)*(F=1)*(T=1)T.820
780 IF(D=2)*(F=2)*(T=2)T.850
785 IF(D=3)*(F=3)*(T=3)T.900
790 IF(D=4)*(F=4)*(T=4)T.950
800 IF(D=5)*(F=5)*(T=5)T.1000
810 P A.540;"NO SCORE";
812 P.A.604;"YOU WIN ";
814 P.A.668;"    $0    ";
815 F.M=1TO3000:N.M
816 P.A.540;"          ";
817 P.A.604;"          ";
818  P.A.668;"             ";
819 GOS.30500:G.112
820 P.A.540;"JACKPOT!";
830 P.A.604;"YOU WIN ";
840 P.A.668;"$";200*P;
845 G.815
850 P.A.540;" 3 KINGS!";
860 P.A.604;"YOU WIN ";
870 P.A.668;"$";160*P;
880 G.815
900 P.A.540;"3 QUEENS!";
910 P.A.604;"YOU WIN ";
920 P.A.668;"$";120*P;
930 G.815
950 P.A.540;" 3 JACKS!";
960 P.A.604;"YOU WIN ";
```

```
970 P.A.668;"$";80*P;
980 G.815
1000 P.A.540;" 3 TENS!!";
1100 P.A.604;"YOU WIN ";
1200 P.A.668;"$";40*P;
1300 G.815
20000 F.N=1TO45:N.N
20010 RET.
30000 F.X=100TO111:F.Y=30TO33
30010 S.(X,Y):N.Y:N.X
30020 S.(112,31)
30030 F.Y=9TO31
30040 S.(113,Y):N.Y
30045 RET.
30050 Y=8
30060 Y=Y+1:R.(113,Y)
30080 IFY=31T.30100
30090 G.30060
30100 S.(113,31)
30110 Y=Y-1:S.(113,Y)
30130 IFY=9T.RET.
30140 G.30110
30500 F.X=79TO111:F.Y=30TO32:S.(X,Y):N.Y:N.X
30510 S.(112,31):S.(113,31)
30520 S.(113,30)
30600 RET.
31000 A=336
31010 I=RND(5)
31020 IFI=1T.P.A.A;"ACE";
31030 IFI=2T.P.A.A;"KING";
31040 IFI=3T.P.A.A;"QUEEN";
31050 IFI=4T.P.A.A;"JACK";
31060 IFI=5T.P.A.A;"TEN";
31070 IFA=364T.RET.
31080 IFA=350T.A=364
31090 IFA=336T.A=350
31100 G.31010
31200 CLS
31210 IN."ENTER A LARGE NUMBER";L
31215 IFL>100T.L=100
31217 IFL<1T.L=1
31220 F.U=1TOL:J=RND(32767):N.U
31230 RET.
```

********** ********** ********** ********** ********** **********

The Melbourne - Eastern Suburbs TRS-80 Users Group

Meetings: 1st Wednesday of the month
Tandy Store
96 Koornane Road
Carnegie

and

3rd Wednesday of the month
Kingswood College
355 Station Street
Box Hill

Contact

John Fletcher, 890677 between 9 and 4

MICRO-80

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** LEVEL II SOFTWARE **

*** NOTICE ***

To improve readers' comprehension of Level II software listings, these have been processed, wherever possible, to improve their readability. This process involves the insertion of a single space after all colons, to more clearly seperate the individual program statements, and, in a few rare instances, the insertion of a single space after other control characters. These spaces, if entered by readers in their versions of our published software, should not normally effect the proper functioning of the published program. However, you will minimise memory requirements by leaving these spaces out. All PRINT STATEMENTS longer than just a few letters, will commence on a new line, so as to make it easier to replicate the original display spacing. Where a line feed/carridge return (produced with the downward arrow key) appears in the original listing, a square bracket will now appear in the published listing. In instances where authors use program lines of more than 240 characters, unfortunately, we are unable to apply this process at present. However, we trust that you will approve of these changes, and would appreciate receiving your comments (good or bad) about this matter. Ed

```
5 ' * * * *  ONE  ARMED  BANDIT  * * * *
6 ' JOHN MASSARA
7 ' 12 WEST ST. FIVE DOCK 2046.  N.S.W.      TEL.:  713-6798
8 ' COPYRIGHT    1980     DO NOT COPY
10 RANDOM
20 CLEAR 100
30 DIM A$(15)
40 FOR X=1 TO 15
50 READ A$(X): NEXT
60 CLS: PRINTTAB(20)
      "ONE ARMED BANDIT"
70 PRINT: PRINT
      "PAYOUTS ARE AS FOLLOWS : "
80 PRINT: PRINT
      "TEN TEN ANY",,"3"
90 PRINT
      "TEN TEN TEN",,"5"
100 PRINT
      "JACK JACK ANY",,"6"
110 PRINT
      "QUEEN QUEEN ANY",,"7"
120 PRINT
      "KING KING ANY",,"8": PRINT"JACK JACK JACK
      ",,"10
      "
130 PRINT
      "QUEEN QUEEN QUEEN","14": PRINT
      "KING KING KING",,
      "18"
140 PRINT
      "ACE ACE ACE",,
      "200 (JACKPOT)"
150 PRINT: PRINT
      "YOU'VE $4.00 IN 20 C COINS TO PLAY WITH. GOOD LUCK!!": M=20
160 INPUT
      "HIT 'ENTER' WHEN READY AND HIT SPACE BAR TO PLAY";H: CLS: PRINT@171,
      "YOU HAVE";: PRINT@186,
      "COINS";: PRINT@180,
```

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```
170 PRINT@336,
      "HIT 'C '  TO COLLECT WININGS": Y$=INKEY$: IF Y$="C" THEN 350
180 Y$=INKEY$: IF Y$="" THEN 180ELSE IF Y$="C" THEN 350
190 PRINT@530,
      "      ";: PRINT@540,
      "      ";: PRINT@550,
      "      ";
200 A1$=A$(RND(15)): A2$=A$(RND(15)): A3$=A$(RND(15))
210 FOR X=1 TO 30: PRINT@530,A$(RND(15));: NEXT: PRINT@530,A1$;:
      FOR X=1 TO 30: PRINT@540,A$(RND(15));: NEXT: PRINT@540,A2$;:
      FOR X=1 TO 30: PRINT@550,A$(RND(15));: NEXT: PRINT@550,A3$;
220 M=M-1: PRINT@180,M;: IF M<0 CLS: PRINT
      "YOU LOST ALL YOUR MONEY ...": PRINT: PRINT: PRINT
      "SORRY BUT I GIVE NO LOANS . . . SEE YOU NEXT TIME.": END
230 IF A1$=
      "TEN  " AND A2$=
      "TEN  " AND A3$=
      "TEN  " M=M+5: PRINT@180,M;: PRINT@793,
      "PAYS  5 !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "            ";
240 IF A1$=
      "JACK " AND A2$=
      "JACK " AND A3$=
      "JACK " M=M+10: PRINT@180,M;: PRINT@793,
      "PAYS  10 !!!";: : FOR I=1 TO 500: NEXT: PRINT@793,
      "             ";
250 IF A1$=
      "QUEEN" AND A2$=
      "QUEEN" AND A3$=
      "QUEEN" M=M+14: PRINT@180,M;: PRINT@793,
      "PAYS  14 !!!":: FOR I=1 TO 500: NEXT: PRINT@793,
      "             ";
260 IF A1$=
      "KING " AND A2$=
      "KING " AND A3$=
      "KING " M=M+18: PRINT@180,M;: PRINT@793,
      "PAYS  18 !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "             ";
270 IF A1$=
      "QUEEN" AND A2$=
      "QUEEN" AND A3$<>
      "QUEEN" M=M+7: PRINT@180,M;: PRINT@793,
      "PAYS  7 !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "            ";
280 IF A1$=
      "ACE  " AND A2$=
      "ACE  " AND A3$=
      "ACE  " M=M+200: PRINT@180,M;: PRINT@793,
      "JACKPOT !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "            ";
290 IF A1$=
      "JACK " AND A2$=
      "JACK " AND A3$<>
      "JACK " M=M+6: PRINT@180,M;: PRINT@793,
      "PAYS  6 !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "            ";
```

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```
300 IF A1$=
      "KING " AND A2$=
      "KING " AND A3$<>
      "KING "  M=M+8: PRINT@180,M;: PRINT@793,
      "PAYS  8 !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "                ";
310 IF A1$=
      "TEN  " AND A2$=
      "TEN  " AND A3$<>
      "TEN  " M=M+3: PRINT@180,M;: PRINT@793,
      "PAYS  3 !!!";: FOR I=1 TO 500: NEXT: PRINT@793,
      "                ";
320 GOTO 170
330 DATA
      "TEN  ","JACK ","QUEEN","KING ","TEN  ","KING ","TEN  ","JACK ","QUEEN"
      "TEN  "
340 DATA
      "ACE  ","QUEEN","JACK ","ACE  ","KING "
350 M1=M: FOR M1=M1 TO 1 STEP -1: PRINT@180,M1;: FOR R=1 TO 20: NEXT: NEXT:
      CLS: T=M/5: PRINT
      "CONGRATULATIONS , YOU'VE RETIRED WITH $";
360 A$=
      "$$$.##": PRINTUSING A$:T
470 PRINT: PRINT
      "SPEND IT IN GOOD HEALTH.": PRINT
475 END
480 FOR X=28 TO 94: SET(X,22): SET(X,28): NEXT
490 FOR Y=22 TO 28: SET(28,Y): SET(94,Y): NEXT
500 FOR Y=22 TO 28: SET(51,Y): SET(71,Y): NEXT
510 FOR X=86 TO 125: SET(X,4): SET(X,9): NEXT
520 FOR X=5 TO 46: SET(X,1): SET(X,9): NEXT
530 FOR Y=1 TO 9: SET(5,Y): SET(46,Y): NEXT
540 PRINT@69,
      "WELCOME TO THE ";
550 PRINT@133,
      "ONE ARMED BANDIT!";
560 FOR X=44 TO 79: SET(X,34): SET(X,40): NEXT
570 FOR Y=34 TO 40: SET(44,Y): SET(79,Y): NEXT
580 PRINT@920,
      "PAY  INDICATOR";
590 RETURN
```

```
0 'KRAZY-KAT (& MOUSE)
1 'COPYRIGHT JAN 1980
2 'RONALD J. SULLY
3 '117 BRYANT RD, LOGANHOLME, QLD 4129
10 CLS: RANDOM
20 PRINTCHR$(23): PRINT@6,
     "KRAZY - KAT ( & MOUSE )";: PRINT@70 STRING$(23,"-");
30 PRINT: PRINT
     "A GAME OF SKILL & CHANCE -": PRINT: PRINT
     "A GAME TO A-MAZE YOUNG & OLD -"
```

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```
40 PRINT: PRINT
      "TEST YOUR REFLEXES AS YOU       (THE CAT) CHASE THE MOUSE...":
      FORT=1TO900: NEXT
50 C$=CHR$(149): M$=
      "    *": CH$=C$+M$
60 FORT=704TO756: PRINT@T,CH$;: FORL=1TO30: NEXT: PRINT@T,STRING$(6," ");:
      FORL=1TO5: NEXT: NEXT
70 PRINT@704,
      "THROUGH A VARIETY OF MAZES ----";: FORT=1TO2500: NEXT: CLS
80 PRINT@21,
      "KRAZY - KAT ( & MOUSE )": PRINT@85,STRING$(23,"-")
90 PRINT
      "CONTROL THE MOVEMENT OF THE CAT BY USING THE FOUR ARROW KEYS.": PRINT
      "IF YOU WISH TO STOP THE CAT AT ANY TIME PRESS THE SPACE BAR."
100 PRINT: PRINT
      "(WARNING - THE CAT IS REALLY CRAZY SO BE PREPARED FOR THE
      UNEXPECTED).
110 PRINT
      "AS WITH ALL CATS, HAVING CAUGHT THE MOUSE, THEY MAY LIKE TO PLAYWITH
      IT. THIS IS AN IDEAL OPPORTUNITY FOR THE MOUSE TO ESCAPE!
120 PRINT: PRINT
      "OH! BY THE WAY, YOU WONT HAVE ALL DAY TO CATCH THE MOUSE. THERE IS A
      TIME LIMIT.
130 PRINT
      "THE CAT SCORES A POINT EACH TIME A MOUSE IS DEVOURED.
140 PRINT
      "THE MOUSE SCORES A POINT IF IT IS NOT CAUGHT.
150 PRINT: PRINT
      "(PRESS C TO CONTINUE)";
160 IFINKEY$<>"C"THEN160ELSECLS
170 PRINT: PRINT: PRINT
      "DEGREE OF DIFFICULTY
180 PRINT: PRINT
      "1.   KITTEN": PRINT
      "2.   ALLEY CAT": PRINT
      "3.   CHAMPION MOUSER
190 PRINT: PRINT
      "SELECT 1, 2 OR 3 .....
200 D$=INKEY$: IFD$=""THEN200
210 DE=INT(ABS(VAL(D$))): IFDE<1ORDE>3THEN200
220 K=DE+1: DE=DE*-1+5: CLS
430 Z$=INKEY$: IFMA=8MA=0: S1=0: S2=0: CLS: GOTO170
440 CLS: GOSUB5000
500 POKEMOUSE,42
510 CH=RND(2): ONCHGOTO1000,2000
1000 IFM2=0THENDI=RND(8): M2=1
1020 IFDI=1ORDI=5ORDI=7M=-1: GOTO1100
1030 IFDI=2ORDI=6ORDI=8M=1: GOTO1100
1040 IFDI=3M=-64: GOTO1100
1050 M=64
1100 POKEMOUSE,32: MOUSE=MOUSE+M
1110 IFPEEK(MOUSE)<>32MOUSE=MOUSE-M: POKEMOUSE,42: GOTO1130
1120 POKEMOUSE,42: GOTO2000
1130 IFDI=1ORDI=5ORDI=7ORDI=2ORDI=6ORDI=8THENDI=INT(RND(0)+3.5): GOTO2000
1140 IFDI=3ORDI=4THENDI=RND(2): GOTO2000
2000 M$="": M$=INKEY$: IFM$=""THEN2505
2010 IFM$=CHR$(8)THENC=-1: E=191: GOTO2500
2020 IFM$=CHR$(9)THENC=1: E=191: GOTO2500
```

```
2030 IFM$=CHR$(10)THENC=64: E=131: GOTO2500
2040 IFM$=CHR$(91)THENC=-64: E=176: GOTO2500
2050 IFM$<>" "THEN1000ELSEC=0
2500 M1=M1+1: IFM1=MXTHENS1=S1+1: GOTO7000
2505 IFC=0THEN1000ELSEPOKECAT,32
2510 IFPEEK(CAT+C)=32THENCAT=CAT+C: POKECAT,191: GOTO1000
2520 RD=RND(K): IFCAT+C=MOUSEANDRD=1THENPOKECAT+C,191: GOTO3000
2530 POKECAT,191: C=-C: M=-M: GOTO1000
3000 S2=S2+1: GOSUB6020
3010 P=CAT-15360: X=P
3020 IFP-64>64THENP=P-64: GOTO3020
3030 IFP<71GOTO3050
3040 PRINT@X-6,
      "GULP!";: GOTO3060
3050 PRINT@X+1,
      "GULP!";
3060 FORT=1TO2000: NEXT: CLS: GOTO430
4999 GOTO4999
5000 A=15360: B=15423: C=176: 'DRAW BOUNDARY
5010 FORL=1TO2: FORD=ATOB: POKED,C: NEXT
5020 A=16256: B=16319: C=131: NEXT
5030 FORL=15424TO16320STEP64: POKEL,191: POKEL+63,191: NEXT
5100 MA=MA+1: ONMAGOTO5200,5300,5400,5500,5600,5700,5800,5900
5200 FORL=15437TO16013STEP64: POKEL,191: POKEL+13,191: POKEL+26,191:
      POKEL+39,191: NEXT
5210 FORL=15760TO16208STEP64: POKEL,191: POKEL+16,191: POKEL+32,191: NEXT
5220 CAT=16189: MOUSE=15427: MX=9*DE: GOTO6000
5300 FORL=15681TO15686: POKEL,140: POKEL+312,140: NEXT
5310 FORL=15646TO15678: POKEL,140: POKEL+355,140: NEXT
5320 FORL=15449TO15833STEP64: POKEL,191: POKEL+398,191: NEXT
5330 POKE15467,191: POKE16322,191: CAT=16189: MOUSE=15427: MX=8*DE: GOTO6000
5400 FORL=15495TO15504: POKEL,131: POKEL+681,176: NEXT
5410 FORL=15607TO15614: POKEL,176: POKEL+458,131: NEXT
5420 FORL=15820TO15860: POKEL,176: NEXT
5430 FORL=15494TO15622STEP64: POKEL,191: POKEL+10,191: POKEL-16,191:
      POKEL+579,191: POKEL+553,191: POKEL+563,191: NEXT
5440 FORL=15712TO15968STEP64: POKEL,191: NEXT
5450 FORL=15447TO15511STEP64: POKEL,191: POKEL+18,191: POKEL+308,191:
      POKEL+477,191: POKEL+704,191: POKEL+722,191: NEXT
5460 CAT=16189: MOUSE=15427: MX=10*DE: GOTO6000
5500 FORL=15561TO15606: POKEL,131: POKEL+256,140: POKEL+512,176: NEXT
5510 FORL=15681TO15702: POKEL,131: POKEL+40,131: POKEL+256,176:
      POKEL+296,176: NEXT
5520 FORL=15584TO16096STEP64: POKEL,191: NEXT
5530 CAT=16224: MOUSE=15456: MX=6*DE: GOTO6000
5600 FORL=15626TO15669: POKEL,140: POKEL+384,140: NEXT
5610 FORL=15809TO15824: POKEL,140: POKEL+46,140: NEXT
5620 FORL=15456TO15520STEP64: POKEL,191: POKEL+320,191: POKEL+704,191: NEXT:
      POKE15904,191
5630 MOUSE=15455: CAT=16226: MX=12*DE: GOTO6000
5700 FORL=15576TO15592: POKEL,131: POKEL+112,131: POKEL+143,131:
      POKEL+368,176: POKEL+399,176: POKEL+512,176: NEXT
5710 FORL=15814TO15865: POKEL,140: NEXT
5720 FORL=15621TO16005STEP64: POKEL,191: POKEL+53,191: NEXT
5730 FORL=15584TO16096STEP64: POKEL,191: NEXT
```

```
5740 FORL=15441TO15633STEP64: POKEL,191: POKEL+30,191: POKEL+576,191:
      POKEL+606,191: NEXT
5750 MOUSE=15458: CAT=16224: MX=12*DE: GOTO6000
5800 FORL=15565TO15569: POKEL,176: POKEL+32,176: POKEL+52,140:
      POKEL+109,140: POKEL+436,140: POKEL+493,140: POKEL+512,131:
      POKEL+544,131: NEXT
5810 FORL=15809TO15820: POKEL,140: POKEL+15,140: POKEL+35,140: POKEL+50,140:
      NEXT
5820 FORL=15510TO15528: POKEL,176: POKEL+640,131: NEXT
5830 FORL=15690TO15695: POKEL,176: POKEL+38,176: POKEL+256,131:
      POKEL+294,131: NEXT
5840 FORL=15497TO15689STEP64: POKEL,191: POKEL+45,191: POKEL+448,191:
      POKEL+493,191: NEXT
5850 FORL=15583TO16095STEP64: POKEL,191: NEXT
5860 FORL=15442TO15570STEP64: POKEL,191: POKEL+26,191: POKEL+317,191:
      POKEL+350,191: POKEL+640,191: POKEL+666,191: NEXT
5870 MOUSE=15886: CAT=15793: MX=14*DE: GOTO6000
5900 FORL=15456TO15648STEP64: POKEL,191: POKEL+35,191: POKEL+92,191:
      POKEL+483,191: POKEL+540,191: POKEL+576,191: NEXT: POKE15426,191
5910 FORL=15527TO15655STEP64: POKEL,191: POKEL+34,191: POKEL+49,191:
      POKEL+79,191: POKEL+233,191: POKEL+264,191: POKEL+418,191:
      POKEL+448,191: POKEL+463,191: POKEL+497,191: NEXT: POKE15486,130
5920 FORL=15440TO15504STEP64: POKEL,191: POKEL+31,191: POKEL+704,191:
      POKEL+735,191: NEXT: POKE16254,160
5930 FORL=15626TO15639: POKEL,140: POKEL+30,176: POKEL+183,140:
      POKEL+200,140: POKEL+231,140: POKEL+384,131: POKEL+414,140: NEXT:
      POKE16193,144
5940 FORL=15840TO15853: POKEL,140: NEXT
5950 MOUSE=16250: CAT=15426: MX=14*DE: GOTO6000
6000 M1=0: POKECAT,191: POKEMOUSE,42: C=0
6010 PRINT@962,
      "** KRAZY - KAT **";
6020 PRINT@990,
      "MICE = ";S1;
      "  CAT = ";S2;: RETURN
7000 POKEMOUSE,32: PRINT@862,
      "** YOUR TIME IS UP **";: GOSUB6020: FORT=1TO2000: NEXT: GOTO430
```

```
4999 'MOVIE MAKER  BY  CHARLIE BARTLETT
50000 CLS:'GRAPHIC ASSEMBLER
50005 PRINT@20,"ASSEMBLER COMMAND MODE":
PRINT:PRINT"     ASSEMBLE = A
    BASIC     = B
    CODES     = C
    DESTROY   = D
    EXAMINE   = E"
50006 N$=INKEY$:PRINT@862,"SELECT :":IFN$=""THEN50006ELSEIFN$="A"GOTO50014
50010 IFN$="E"THEN50200ELSEIFN$="D"THEN50500ELSEIFN$="C"THEN50300ELSEIFN$="B"END

50012 GOTO50000
50014 CLS
50015 INPUT"WHICH LINE NUMBER";N:F=17129:IFN=-1THEN50000ELSEIFN>49999THEN50030
50020 T=PEEK(F)+256*PEEK(F+1):M=PEEK(F+2)+256*PEEK(F+3):IFM<NTHENF=T:GOTO50020EL
SEIFM=NTHEN50040
```

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```
50030 PRINT"LINE NOT IN PROGRAM":GOTO50015
50040 PRINT
"POS$   VAL.    CHR$","NEW$"
50050 FORI=F+4TOT-2
50060 X=PEEK(I):PRINTI;X,:IFX<192ANDX>128PRINTTAB(POS(0)+4*(I/2-INT(I/2)))CHR$(X
),:GOTO50080
50070 IFX=32PRINT"BLANK",ELSE IFX<32PRINT"CONTROL",ELSE IFX>191PRINT"SP COMP."X-
192,ELSEPRINTCHR$(X),
50080 X$="":INPUTX$:IFX$=""THEN50120ELSEIFASC(X$)=91ANDI>F+4I=I-1ELSE50100
50090 GOTO50060
50100 X=VAL(X$):IFX=0GOTO50000ELSEIFX<0ORX>255PRINT"ERROR":GOTO50060ELSEPOKEI,X
50110 IFX<192ANDX>128PRINTTAB(40+4*(I/2-INT(I/2)))CHR$(27)CHR$(X)
50120 NEXT
50130 GOTO50000
50200 CLS:PRINT:PRINT:FORI=F+4TOT-2:X=PEEK(I):PRINTCHR$(X);:NEXT:PRINT@832,"";:G
OSUB50600:GOTO50000
50300 CLS:INPUT"TYPE 1 FOR GRAPHIC CHARACTERS, 2 FOR SPACE COMPRESSION CODES OR
3 FOR CONTROL CODES ";V:IFV=2THEN50350ELSEIFV=3THEN50400ELSEIFV=1THEN50310ELSE50
300
50310 Y=129:CLS
50315 FORY1=YTOY+21:XX=XX+1:PRINTY1;CHR$(Y1),
50320 IFXX=4THENXX=0:PRINTCHR$(26)
50325 NEXT:GOSUB50600:CLS:XX=0
50330 Y=Y+21:IFY=192GOTO50000
50335 CLS:GOTO50315
50350 CLS:Y1=192
50355 FORY=Y1TOY1+21:PRINT"SP COMP.";Y;"=";Y-192,:NEXT:GOSUB50600
50360 Y1=Y1+21:IFY1=255GOTO50000
50365 CLS:GOTO50355
50400 PRINT"CONTROL CODES

 8 = BACKSPACES AND ERASES CURRENT CHARACTER
10-13 = CARRIAGE RETURNS
14 = TURNS ON CURSOR
15 = TURNS OFF CURSOR
23 = CONVERTS TO 32 CHARACTER MODE
24 = BACKSPACE CURSOR
25 = ADVANCE CURSOR
26 = DOWNWARD LINEFEED"
50405 PRINT"27 = UPWARD LINEFEED
28 = HOME, RETURN CURSOR TO DISPLAY POSITION (0,0)
29 = MOVE CURSOR TO BEGINNING OF LINE
30 = ERASE TO THE END OF THE LINE
31 = CLEAR TO THE END OF THE FRAME":GOSUB50600:GOTO50000
50500 CLS:PRINT:INPUT"CONFIRM YOUR INTENTION TO DELETE GRAPHIC ASSEMBLER
BY TYPING , KILL , ELSE PRESS ENTER TO ABORT COMMAND";Z$:IFZ$="KILL"GOTO50520
50510 CLS:PRINT"ABORT COMMAND":FORQ=1TO1000:NEXT:GOTO50000
50520 CLS:PRINT"GRAPHIC ASSEMBLER DELETED":DELETE50000-50600
50600 INPUT"PRESS ENTER WHEN READY";Z$:RETURN
```

From: ROB CALLANDER, Burwood, Vic.
In your last issue you asked for ideas for a real newsletter.
May I suggest an article explaining what happens when you CLOAD in a tape - the strings of Zeros, etc.
What happens at the end of the CLOAD?
Why can't you CLOAD just half a program?
What happens when you CSAVE?

Good luck with your excellent magazine.

(Thanks for the encouragement, Rob. Eddie Paay is presently preparing a book - the LEVEL II ROM-MAP - which SHOULD explain how these routines operate. We are hoping to release the first copies towards the end of next month, and if he's left the answers to your questions out, he'll just have to write an article for the magazine as pennance. Ed.)

From: DAN LAWRENCE, Coogee, NSW.
As the owner of a 16K Level II '80, I am interested in the memory expansion board you intend to produce. When planning the motherboard perhaps you could give some consideration to bank switching and, thus, increase the RAM capacity.

As an accountant, I am interested in programs of the following nature: (1) General Ledger, initially with journal entry only,and producing (i) trial balance (ii) profit and loss account (iii) balance sheet; (2) Other financial accounting systems which would preferable integrate into the general ledger, gradually developed and introduced, such as (i) sales invoicing and sales journal (ii) purchases journal (iii) cash receipts (iv) debtors ledger (v) creditors ledger (vi) cheque payments (vii) inventory records (viii) wages and wages records.

I know this is a formidable list and is currently being sold fo about $500 in the U.S. However there is no harm in asking.

My impression of MICRO-80 is that by the end of one year you will have a respected publication. It certainly merits promotion in the U.S. right now. Congratulations and good luck.

(Gee, Dan. We just love that praise everyone keeps heaping on us. Thank you. The memory expansion board has had a few teething problems, but is well under way. No probable dates yet, though, until it's working 110%
As for your requests, well, any one of those little packages you listed could fill a whole year's magazines, but some of our tame genius's are working along those general directions, but very slowly. If the whole package is to integrate properly, it all has to be completed before you can even admit to having even one part of the whole, so it will be a few months before we can release the package - probably through MICRO-80 PRODUCTS. Ed.)

From: F.A. TAXVIG, Lambton, NSW.
May I express my appreciation for the ever improving (except for the printing) magazine. I was specially pleased to read your plug for the tape read modification. Life was not worth living without it.

Has anyone come up with a similarly effective solution to the pest "keybounce". If so please let us poor sufferers hear about it - the sooner the better.

(TANDY does supply a software fix KBFIX with all Level II machines sold, now, and they are also slowly introducing a new style of keyboard which (allegedly) helps. In the U.S. this keyboard is available as a retrofit - at a price - but not here yet.
Peter Hartley has his own fix - which he swears by - and it appears to work. The idea is to purchase a diamond dust faced abrasive spatula - which cost him about $20! - and to use it to carefully clean the keyswitch contacts, within each key assembly. You then flood the assembly with C.R.C. electrical quality silicone (No 02094) and simply accept that you'll have dribbles from the computer for the next month ot two. He did this last August, so he claims, and says that he's never had a bounce since! Ed.)

From Mr P Evant
In reference to the hint in the February Issue regarding the use of a silicone based cleaner on keyboard contacts...
I have worked in a telephone exchange for many years, and one of our big problems is "high resistance relay contacts".
About 10 or 15 years ago we found that this problem was increasing dramatically,, and it was found that the plastic lifting pins had been moulded in a silicone grease. The migration of this grease to the relay contacts was the culprit.

This was later shown to be due to the arcing at the contacts turning the silicone into a semi-glazed material.

The contacts on my '80 appear to be pressure contacts and not wiping contacts. (i.e. they are similar to relay contacts) and I would be very wary about the use of this product.

(Thank you for your comments, Mr Evant. It is quite correct to say that the '80 does have pressure and not wiping contacts. However, I am sure that you will agree that there is an infinitely greater risk of silicone "glazing" in an exchange situation, where the relays carry 40 volts at up to 3 amps, than in an '80 keyboard, where we are dealing with TTL votages (say 2 volts max) at nano-amps current. Also, of course, the quality of silicone-type lubricants and corrosion inhibitors has improved markedly during the last 10 or 15 years. As always, the proof of the pudding is in the eating, and Peter's very happy. But, there is always KBFIX. Ed.)

From: ALFRED F. WEST, Brunswick, VIC
I purchased a hard copy of the listing of BMON and I have some comments that you may care to pass of to Eddy Paay.

After double checking whether I had copied the listing correctly, I still found that RENUMBER and MERGE only worked sometimes in respect of THEN, GOTO, etc.
Eventually, after much fiddling around I discovered that it doesn't work IF THERE IS A SPACE BEFORE THE NUMBER in these cases. As I was using BMON on programs that I had written in the days when I scattered blank spaces around in profusion, I was getting plenty of problems.

Now, just as I note in some of your published programs, I leaved space after the number to allow for renumbering later. But I still often need to leave a space before the number, so that the jump point is clear when looking at a listing.

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Perhaps Eddy would be able to make some modification to correct this - alternatively, you should publish a note regarding this particular limitation of BMON.

I have a habit of accidently hitting the shift key while typing, so I would like to see a routine to preclude the entering of ASCII codes 96 to 127 when they are not required.

As I have said before, keep up the good work. MICRO-80 is getting better and better.

(Thank you for pointing out this problem with BMON. Eddy has taken good care of this, and the alterations in this month's installment (the last) have taken good care of the matter. There is, incidently, no need to leave spaces around line numbers for renumbering purposes when using BMON, unless you are planning on packing as much as possible onto the line. The renumbering routine will open or close up space in the line as needed.
We'll add your other request to the stack, and I'm sure that one of the readers will come up with the answer before long. Ed.)

tick where appropriate

To MICRO-80
Please consider the enclosed program for...

(i) Publication in MICRO-80

(ii) Publication on disk or cassette only

(iii) Both

Name.....

Address.....

.....

.....Post Code.....

***** CHECK LIST *****

Please ensure that the cassette or disk is clearly marked with your name and address, program name(s), Memory size, Level I, II, System 1 or 2, Edtasm, System, etc. The use of REM statements with your name and address is suggested, in case the program becomes seperated from the accompanying literature.

Ensure that you supply adequate instructions, notes on what the program does and how it does it...etc

For system tapes, the start, end, and entry points, etc

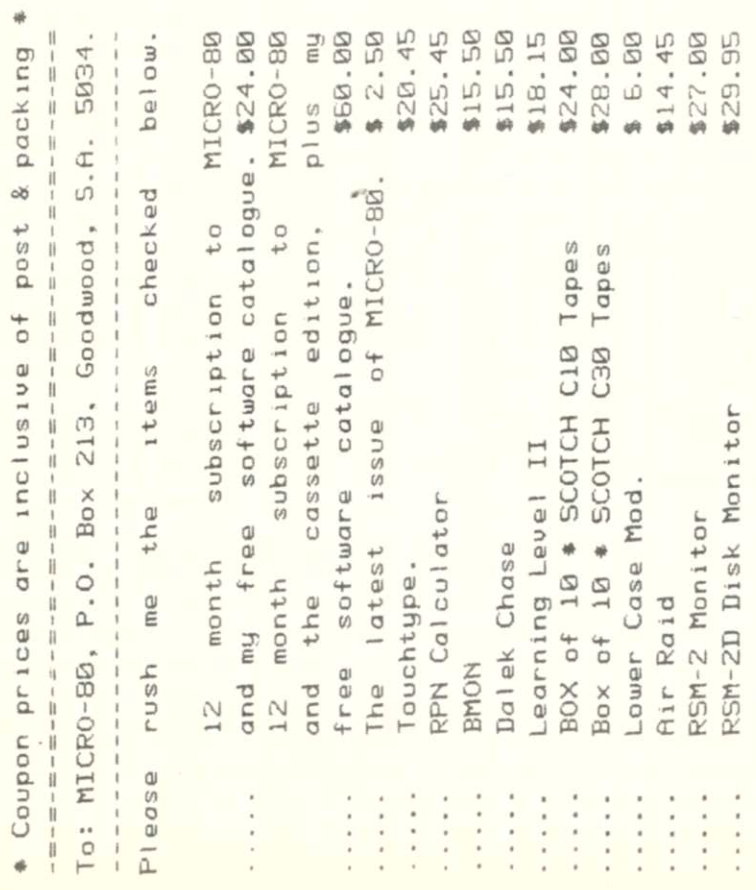
The changes or improvements that you think may improve it.

Please package securely - padabags are suggested - and enclose stamps or postage if you want your cassette or disk returned.

Please do not get excited if you do not hear from us for some length of time, as we are trying very hard to catch up with the current backlog.

129	FOR	160	OUT	191	USING	221	SQR
130	RESET	161	ON	192	VARPTR	222	RND
131	SET	162	OPEN	193	USR	223	LOG
132	CLS	163	FIELD	194	ERL	224	EXP
133	CMD	164	GET	195	ERR	225	COS
134	RANDOM	165	PUT	196	STRING$	226	SIN
135	NEXT	166	CLOSE	197	INSTR	227	TAN
136	DATA	167	LOAD	198	POINT	228	ATN
137	INPUT	168	MERGE	199	TIME$	229	PEEK
138	DIM	169	NAME	200	MEM	230	CVI
139	READ	170	KILL	201	INKEY$	231	CVS
140	LET	171	LSET	202	THEN	232	CVD
141	GOTO	172	RSET	203	NOT	233	EOF
142	RUN	173	SAVE	204	STEP	234	LOC
143	IF	174	SYSTEM	205	+	235	LOF
144	RESTORE	175	LPRINT	206	-	236	MKI$
145	GOSUB	176	DEF	207	*	237	MKS$
146	RETURN	177	POKE	208	/	238	MKD$
147	REM	178	PRINT	209	up arrow	239	CINT
148	STOP	179	CONT	210	AND	240	CSNG
149	ELSE	180	LIST	211	OR	241	CDBL
150	TRON	181	LLIST	212	>	242	FIX
151	TROFF	182	DELETE	213	=	243	LEN
152	DEFSTR	183	AUTO	214	<	244	STR$
153	DEFINT	184	CLEAR	215	SGN	245	VAL
154	DEFSNG	185	CLOAD	216	INT	246	ASC
155	DEFDBL	186	CSAVE	217	ABS	247	CHR$
156	LINE	187	NEW	218	FRE	248	LEFT$
157	EDIT	188	TAB	219	INP	249	RIGHT$
158	ERROR	189	TO	220	POS	250	MID$
159	RESUME	190	FN				

***** TRS-80 INTERNAL CODES FOR BASIC KEYWORDS *****
(also the tokens which will appear in strings created with MOVIE MAKER)



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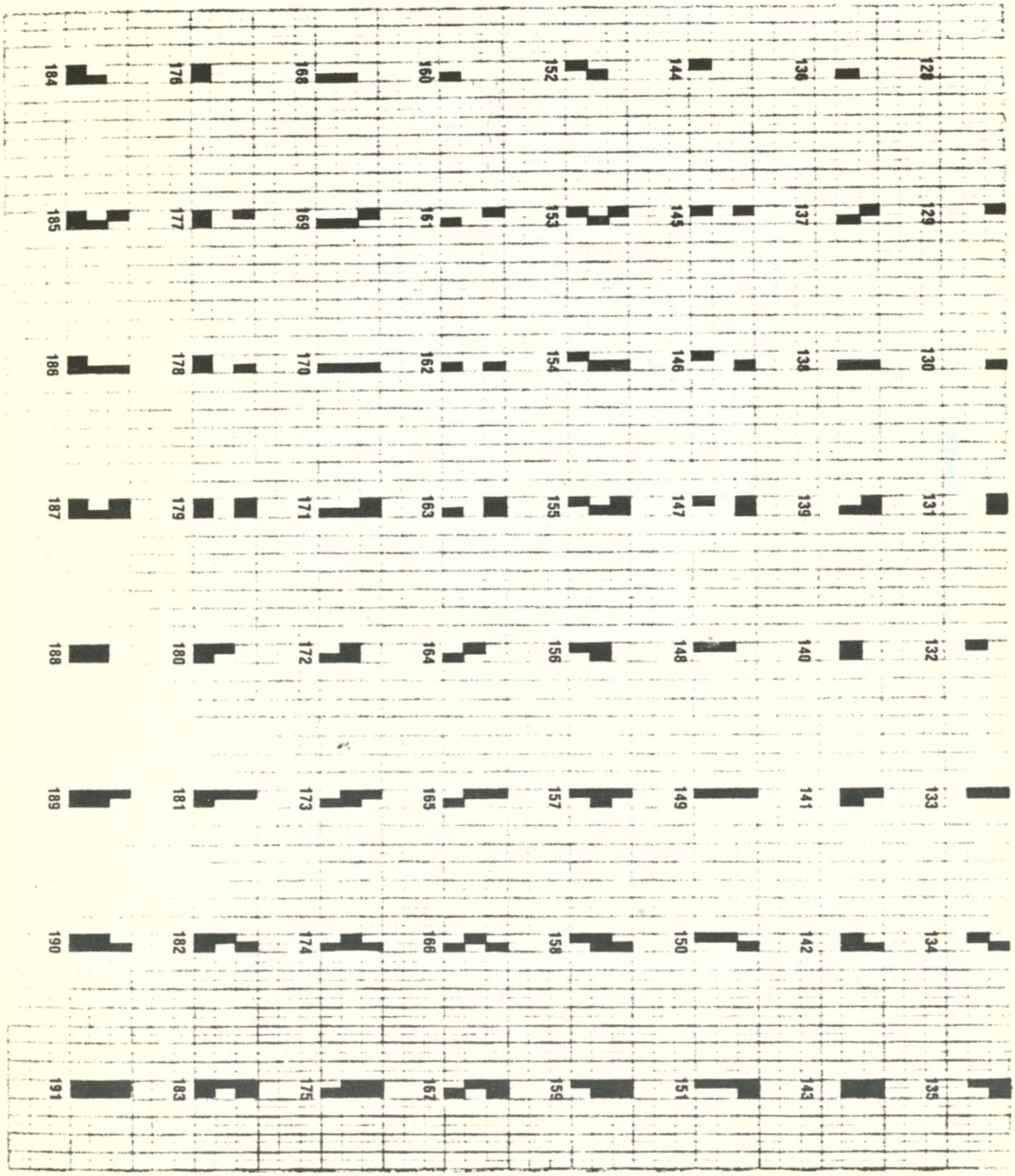
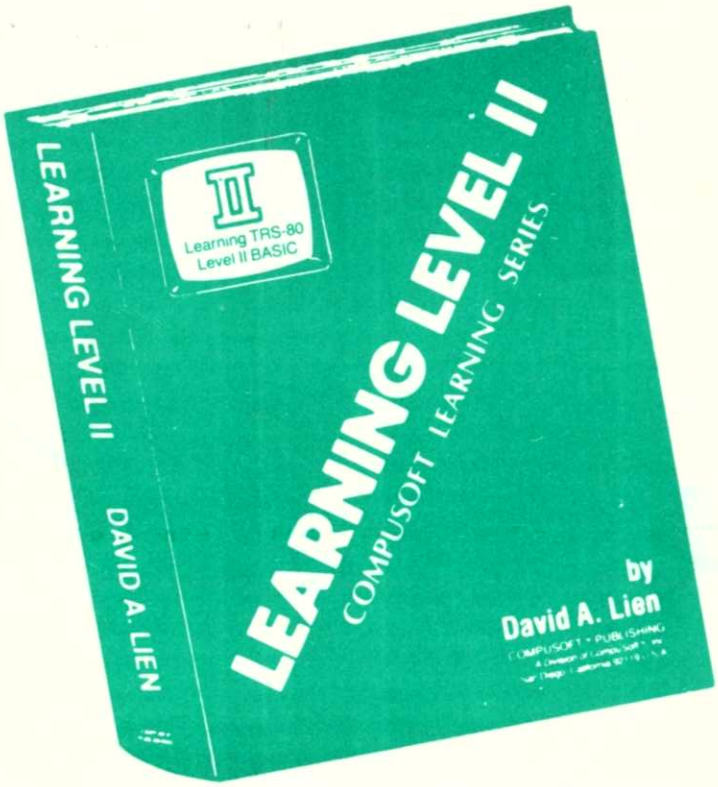
***** TRS-80 GRAPHIC CHARACTERS AND THEIR TOKEN VALUES *****



It's Here At Last . . .



Written by the author of your Level I Users Manual, LEARNING LEVEL II picks right up where the Level I Manual leaves off. It also supplies the changes needed to make the Level I Manual compatible with your Level II TRS-80.

LEARNING LEVEL II covers all Level II BASIC beyond Level I, plus much more. It shows you how to use the Editor, explains what the many error messages are really saying, and leads you thru conversions of Level I programs to Level II.

Dual cassettes, printers, the Expansion Interface with clock and other features are explained in the same easy-to-learn style that made the Level I Manual famous. LEARNING LEVEL II was created specifically for your Level II TRS-80!